

# U.S. consumers: which jobs are they creating?

*The purchasing decisions consumers make help determine where the jobs are in the economy; as spending choices change over the 1994–2005 period, so will the industries and occupations employing the workers*

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We are a Nation of spenders. U.S. consumers are spending more than ever on a variety of goods and services ranging from automobiles and VCR's to hospital care and legal advice. In the process of making these purchases, consumers are creating jobs. In 1993, nearly two-thirds of all jobs in the U.S. economy were dependent, either directly or indirectly, on consumer expenditures, making consumers responsible for more than 79 million jobs that year. The dominant influence of consumers on the job market is not expected to diminish—they are projected to continue generating nearly two-thirds of all U.S. jobs, translating to more than 92 million consumption-related jobs expected for the year 2005.

This article examines domestic employment that is dependent on consumer spending.<sup>1</sup> The consumption-related jobs of the 1977–93 period are compared with those expected for the 1994–2005 period,<sup>2</sup> using the most recent economic and employment projections developed biennially by the Office of Employment Projections.<sup>3</sup> The number and types of jobs dependent on consumption were estimated using an input-output model approach that enables one to trace the purchase of a good or service through the entire production chain so that the employment required in each industry, including the industries that supply inputs to the production process, to produce the good or service can be determined. In addition, an industry-occupation matrix was used to determine the occupations affected by consumer

spending. (See the appendix for a full description of data and methods.)

## Consumption and jobs—an overview

Personal consumption expenditures, or consumer spending, is estimated by the Bureau of Economic Analysis, U.S. Department of Commerce, as part of the national income and product accounts.<sup>4</sup> Consumer spending is defined as the market value of purchases of goods and services by individuals and nonprofit institutions. It includes the value of certain imputed goods and services, such as the rental value of owner-occupied homes, and compensation paid in-kind, such as employer-paid health and life insurance premiums. The sources of income used for consumption purposes include not just wages, salaries, interest, property, and other income, but also transfer payments such as Social Security, unemployment insurance, and welfare payments.

Many factors influence consumer spending. Over the 1977–93 period, these factors included: changing demographic trends, such as a growing elderly population, the aging of the baby boomers and their establishment in the work force, and an increase in birth rates in the early 1970's;<sup>5</sup> an increase in women's labor force participation rates, along with an increase in dual-income families and single families with women heads of household; growth in personal income as a share of total income and a decline in the personal savings rate;<sup>6</sup> an increase in consumer installment debt; growth in residential housing construction and new household formation;<sup>7</sup> and technological ad-

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vances spurring the development of new and better consumer products. While some of these factors will affect consumer spending in a similar manner through the year 2005, others will not. Specifically, slower population growth is expected for the 1994–2005 period; the aging baby boomers will move toward their retirement years, rather than into the work force as they did during the 1977–93 period; and growth in women's labor force participation rates is expected to slow.

Table 1 shows the significant changes in consumer purchases from 1977 to 1993, and those expected in the future. Over the 1977–93 period, consumer purchases of services and durable goods grew as a share of all consumer spending, while the share of spending on nondurable goods declined—a trend that is expected to continue to 2005. Within the durable goods category, the greatest growth by far was, and is expected to be, in consumer electronics. The introduction of new and better video and audio products, as well as personal computers and related hardware and software, has translated to skyrocketing purchases by consumers. Another area of strong growth in durable goods, also projected to continue into the future, is expenditures associated with homeownership—kitchen and household appliances; furniture; china, glassware, and utensils; and other durable housefurnishings. Within services, the most notable increase occurred in health-related expenditures. Not just the level, but the share of consumer spending on physicians, hospitals and nursing homes, and other professional medical services soared over the period, and is expected to continue to grow strongly in the future. Growth in health-related spending is attributable in part to technological advances that make new

and often more expensive procedures available, as well as longer life expectancies and a growing elderly population. Consumer expenditures on recreation and travel also grew significantly, with consumers spending more on entertainment activities ranging from sightseeing and air travel services to gambling and concerts. Growth is expected to continue into the future, though not at the rate of the historical period. Within the nondurable goods category, the *share* of consumer spending going toward food has declined, though the *level* of food expenditures did, and is expected to continue to, grow. As personal incomes rise, consumers tend to spend a smaller share of their income on necessities, such as food, and a greater share on nonnecessities. Another trend in nondurable goods is the decline in consumer spending on tobacco products both in terms of the level and as a share of total consumer spending. Given the efforts to warn consumers of the dangers of tobacco use, such a trend is not surprising, and is expected to continue into the future. Also notable is the decline in consumer energy use. Spending on gasoline and motor oil for automobiles, as well as on fuel oil, coal, natural gas, and electricity (the latter two are classified as services) for our homes, declined as a share of all consumer expenditures, and is expected to continue to do so, as a result of improved energy efficiency and raised concerns about energy use.<sup>8</sup>

When consumers purchase various products and services, certain industries are responsible for producing the final goods or services, and others provide the materials needed to produce these goods or services. It is in all of these industries that consumer spending generates employment—a purchase triggers the need for production and therefore workers to make the good or service.

Since 1977, the consumer's role in generating jobs in our economy has become even more prominent. The proportion of the economy's jobs generated by consumer expenditures increased from 60 percent in 1977 to 64 percent in 1993. (See table 2.) Part of the reason for this growth in share is additional disposable income that consumers spent rather than saved, allowing consumption related employment to increase as a share of total employment. However, the rate of increase in jobs related to consumer spending (40.4 percent) is less than the rate of increase in consumer spending (47.7 percent) over the 1977–93 period. This difference can

**Table 1. Personal consumption expenditures, historical years 1977 and 1993, and projected 2005**

Category	Billions of 1987 dollars			Percent distribution		
	1977	1993	Projected 2005	1977	1993	Projected 2005
Total personal consumption expenditures .....	2,296.6	3,458.7	4,554.7	100.0	100.0	100.0
Durables .....	280.0	489.9	745.9	12.2	14.2	16.4
Motor vehicles and parts .....	137.3	196.1	245.8	6.0	5.7	5.4
Household furnishings and other goods ....	91.4	214.1	388.2	4.0	6.2	8.5
Other durable goods .....	51.3	79.7	111.9	2.2	2.3	2.5
Nondurables .....	819.8	1,078.5	1,299.0	35.7	31.2	28.5
Food and beverages .....	441.5	524.0	596.7	19.2	15.2	13.1
Clothing, shoes, and luggage .....	108.7	197.8	262.1	4.7	5.7	5.8
Other nondurable goods .....	269.6	356.7	440.1	11.7	10.3	9.7
Services .....	1,196.8	1,890.3	2,509.7	52.1	54.7	55.1
Housing .....	355.4	492.6	561.8	15.5	14.2	12.3
Utilities .....	90.2	120.5	146.3	3.9	3.5	3.2
Other household operation services .....	60.8	104.8	162.1	2.6	3.0	3.6
Transportation related services .....	90.2	127.9	155.0	3.9	3.7	3.4
Health related services .....	267.9	466.4	648.5	11.7	13.5	14.2
Financial services .....	111.3	205.7	302.0	4.8	5.9	6.6
Legal services .....	24.6	41.1	58.6	1.1	1.2	1.3
Recreation .....	52.7	112.6	180.1	2.3	3.3	4.0
Education .....	47.9	78.6	111.5	2.1	2.3	2.4
Religious and welfare activities .....	43.9	100.6	153.4	1.9	2.9	3.4
Other services .....	51.9	39.6	30.5	2.3	1.1	0.7

SOURCE: Historical data from Bureau of Economic Analysis; Projections from Bureau of Labor Statistics.

**Table 2. Consumption and employment, by industry, selected years 1977 and 1993, and projected 2005**

Industry	Personal consumer expenditures on domestically produced commodities (in billions of 1987 dollars)			Total final demand spending (in billions of 1987 dollars)			Personal consumer expenditures as a percent of total spending		
	1977	1993	Projected 2005	1977	1993	Projected 2005	1977	1993	Projected 2005
All sectors .....	2,226.7	3,289.1	4,190.3	3,533.2	5,134.6	6,829.7	63.0	64.1	61.4
Goods producing .....	540.0	623.3	710.1	1,265.4	1,653.5	2,123.3	42.7	37.7	33.4
Agriculture, forestry, and fisheries ..	16.5	26.7	33.2	31.0	33.7	44.6	53.1	79.2	74.3
Mining .....	0.3	0.1	0.2	-21.4	-23.3	-53.3	-1.5	-0.5	-0.3
Construction .....	0.0	0.0	0.0	379.3	455.8	556.5	0.0	0.0	0.0
Manufacturing .....	523.2	596.5	676.8	876.6	1,187.3	1,575.4	59.7	50.2	43.0
Durables .....	140.4	169.8	192.1	448.1	683.7	972.7	31.3	24.8	19.8
Nondurables .....	382.8	426.8	484.7	428.5	503.6	602.7	89.3	84.7	80.4
Service producing .....	1,593.7	2,505.8	3,323.2	2,125.6	3,235.8	4,360.8	75.0	77.4	76.2
Transportation .....	58.0	78.1	96.8	95.1	142.1	209.2	61.0	54.9	46.3
Communications .....	35.0	81.9	151.2	47.2	103.0	191.9	74.2	79.5	78.8
Utilities .....	85.4	112.5	134.4	94.4	132.2	158.1	90.5	85.1	85.0
Trade .....	481.3	739.2	987.1	549.6	869.7	1,270.3	87.6	85.0	77.7
Finance, insurance, and real estate .....	486.2	726.1	898.3	536.7	813.5	1,033.4	90.6	89.3	86.9
Services .....	538.9	915.3	1,272.1	557.5	945.3	1,335.3	96.7	96.8	95.3
Government .....	11.4	21.8	31.3	415.0	518.7	563.6	2.7	4.2	5.6
Special industries .....	-9.6	-8.9	-91.1	-27.6	-43.6	-55.5	34.9	20.5	164.2

Sector	Consumer-related employment (in thousands)			Total employment (in thousands)			Consumer-related employment as a percent of total employment		
	1977	1993	Projected 2005	1977	1993	Projected 2005	1977	1993	Projected 2005
All sectors .....	56,406.9	79,227.4	92,700.6	93,442.7	123,650.4	144,708.2	60.4	64.1	64.1
Goods producing .....	13,840.9	12,745.1	11,820.8	29,101.2	28,706.0	28,844.2	47.6	44.4	41.0
Agriculture, forestry, and fisheries .....	2,560.8	2,528.1	2,469.6	3,395.3	3,297.4	3,399.2	75.4	76.7	72.7
Mining .....	338.6	255.5	157.4	833.8	627.7	452.1	40.6	40.7	34.8
Construction .....	746.1	910.5	1,100.0	4,844.3	6,250.6	7,490.7	15.4	14.6	14.7
Manufacturing .....	10,195.5	9,051.0	8,093.9	20,027.8	18,530.3	17,502.2	50.9	48.8	46.2
Durables .....	3,864.9	3,082.1	2,574.6	11,790.6	10,486.6	9,591.4	32.8	29.4	26.8
Nondurables .....	6,330.6	5,968.9	5,519.3	8,237.2	8,043.7	7,910.8	76.9	74.2	69.8
Service producing .....	42,566.0	66,482.3	80,879.7	64,341.5	94,944.4	115,864.0	66.2	70.0	69.8
Transportation .....	1,781.0	2,360.9	2,581.5	2,992.0	3,966.0	4,663.6	59.5	59.5	55.4
Communications .....	847.8	956.5	921.0	1,185.2	1,288.0	1,252.5	71.5	74.3	73.5
Utilities .....	564.3	718.7	704.7	751.0	957.5	951.2	75.1	75.1	74.1
Trade .....	16,964.4	23,529.7	25,755.6	20,533.6	27,728.3	31,231.0	82.6	84.9	82.5
Finance, insurance, and real estate .....	3,983.7	6,207.5	6,645.1	4,824.4	7,436.5	8,120.6	82.6	83.5	81.8
Services .....	17,205.6	31,162.8	42,631.6	18,934.2	34,727.1	48,655.4	90.9	89.7	87.6
Government .....	1,219.2	1,546.3	1,640.3	15,121.1	18,841.0	20,989.7	8.1	8.2	7.8
Special industries .....	0.0	0.0	0.0	0.0	0.0	0.0	( 1 )	( 1 )	( 1 )

<sup>1</sup> Data are not available.

NOTE: The negative value for personal consumer expenditures in "special industries" results from an accounting convention used to move expenditures in the U.S. by foreigners from personal consumption expenditures to exports. The negative value for total final demand spending in "special in-

dustries" results from this same accounting convention as well as from the impact of the noncomparable imports industry (goods not capable of being produced in the United States) and the scrap, used, and secondhand goods industries. Total final demand spending in mining is negative because purchases of imports outvalue purchases of domestically produced goods.

be attributed to productivity growth—as real consumer spending on goods and services increased, firms met this demand, in part, by producing more with a given number of workers and by investing in labor-saving technologies. In addition, some of the difference may have been attributable to changes in the input requirements of producing industries. As new technologies are developed and input requirements change, employment is affected if the labor intensity of the competing input industries vary.

## Industries and their consumption dependency

Consumer spending generates employment in every one of the 185 industries in the Bureau of Labor Statistics sectoring plan except 10, which tend to be government-related industries and special industries designed for input-output accounting conventions. The degree to which an industry depends on consumers for employment can be estimated by the ratio of consumption-related employment to total employment for an

industry. As the following tabulation shows, the industries most heavily dependent on consumer spending in 1993 were almost all services industries oriented toward consumers:

<i>Industry</i>	<i>Consumer-related employment as a percent of total employment</i>
Educational services .....	100.00
Hospitals .....	100.0
Health services (not elsewhere classified) .....	100.0
Amusement and recreation services (not elsewhere classified) .....	100.0
Museums, botanical, zoological services .....	100.0
Child day care services .....	100.0
Offices of health practitioners .....	100.0
Private households .....	100.0
Residential care .....	100.0
Beauty and barber shops .....	99.9
Video tape rental .....	99.4
Funeral service and crematories .....	99.1
Federal Government enterprises (not elsewhere classified) .....	98.4
Watch, jewelry, and furniture repair .....	97.6

The one industry on the list that is not a service industry is Federal Government enterprises, not elsewhere classified. Consumers are important to this industry because it includes federally operated services such as military post exchanges and the earnings of federal mortgage associations. Outside of the services industries, the industries most dependent on consumer spending tend to be manufacturing industries that produce and process food, including beverages and bakery products and eating and drinking places.

The following tabulation shows the industries least dependent on consumer spending for employment in 1993. The list is dominated by manufacturing industries and construction,<sup>9</sup> industries in which a significant portion of employment is generated by business investment, exports, and government spending:

<i>Industry</i>	<i>Consumer-related employment as a per- cent of total employment</i>
Search and navigation equipment .....	2.4
Aerospace .....	5.8
Construction and related machinery .....	6.2
Partitions and fixtures .....	7.5
Communications equipment .....	7.7
Wood buildings and mobile homes .....	8.5
Railroad equipment .....	8.8
Special industry machinery .....	10.0
Measuring and controlling devices .....	10.5
Computer and office equipment .....	11.5
Oil and gas field equipment .....	11.7
General industrial machinery .....	14.3
Construction .....	14.6
Metalworking machinery and equipment .....	14.8
Electric distribution equipment .....	15.4

It may seem surprising that computer and communications equipment are two industries least dependent on consumer spending, given the surge in consumer purchases on computers and equipment such as faxes, modems, and answering machines. However, business investment dwarfs consumer spending on these products, and imports are substantial, so despite rapid growth in consumer purchases, the domestic industries still depend little on consumer spending for employment.

There are exceptions to the rule that the industries most dependent on consumer spending are services and the least dependent are manufacturing. The exceptions involve the manufacture of consumer-oriented products—industries such as household furniture, jewelry, silverware, and plated ware, and toys and sporting goods, which are very dependent on consumer spending for employment despite the fact that they are manufacturing industries. Another exception involves those industries that provide business services, such as engineering and architectural services, as well as research and testing services. Although they are services industries, employment in these industries is driven more by business investment and government purchases than by consumer spending.

## Occupations and consumption dependency

Consumer spending affects employment in every one of the 278 occupations used in the BLS industry-occupation matrix. As the following tabulations show, some occupations are strongly dependent on consumer spending for employment, while others depend on consumption very little.

<i>Occupations most dependent on consumption</i>	<i>Consumer-related employment as a percent of total wage and salary employment, 1993</i>
Shoe sewing machine operators and tenders .....	100.0
Private household workers .....	100.0
Directors; religious activities and education .....	99.5
Funeral directors and morticians .....	98.3
Dietitians and nutritionists .....	97.1
Medical secretaries .....	95.8
Nuclear medicine technologists .....	95.5
Physical therapists .....	95.1
Respiratory therapists .....	95.0
Dental hygienists .....	94.7
Dentists .....	94.5
Medical assistants .....	94.4
Waiters and waitresses .....	94.3
Restaurant cooks .....	94.0
Radiologic technologists and technicians .....	93.9

*Occupations least dependent  
on consumption*

*Consumer-related  
employment as a  
percent of total  
wage and salary  
employment, 1993*

Shipfitters .....	7.5
Police detectives and investigators .....	10.9
Firefighting and prevention supervisors ....	11.4
Government chief executives and legislators .....	11.5
Sheriffs and deputy sheriffs .....	11.5
Police and detective supervisors .....	11.6
Municipal clerks .....	11.6
Correction officers .....	11.6
Police patrol officers .....	11.7
Firefighters .....	11.9
Subway and streetcar operators .....	12.0
Air traffic controllers .....	13.3
Other law enforcement occupations .....	13.6
Paving, surfacing, and tamping equipment operators .....	13.8

The occupations most dependent on consumer expenditures involve a range of training, education requirements, and salaries.<sup>10</sup> Included among these top 15 are many professional specialty occupations, such as dentists and therapists, who generally have more training and education and earn more than the average worker. Note that although these individual professional specialty occupations are among the most dependent on consumption, the professional specialty group as a whole ranks almost last in terms of its dependency on consumer spending (table 3) because a significant number of these jobs in this broad occupational group are generated by business investment and government spending. Also prominent on the list of the most consumer-dependent occupations are service occupations and operators, fabricators, and laborers—workers that tend to be at the lower end of the training, education, and compensation spectrum. Noticeably absent from the

list are marketing and sales occupations, an occupational group with varied training, education, and compensation levels. While none of the individual occupations in this group rank among the 15 most consumption-dependent occupations, the group as a whole is actually the most dependent. Their dependence on consumption makes sense, given the role these workers play: serving as intermediaries for just about every industry that produces the goods and services purchased by consumers.

Despite the fact that as a group, the service occupations are highly dependent on consumer spending, more than half of the 15 individual occupations listed as the least dependent on consumption are service occupations. Specifically, they are service workers involved in protective functions such as law enforcement and firefighting, which are occupations that typically pay more and require more training than the average service occupation. As a group, the precision production, craft, and repair occupations, as well as operators, fabricators, and laborers, tend to be the least dependent on consumption for employment, and some of the individual occupations in the groups are included on the list, such as shipfitters and subway operators.

## Changes in consumer-related employment

*Industries.* Over the 1977–93 period, the services industries remained the most dependent on consumption for employment, while manufacturing and construction remained the least. On the whole, industries became more dependent on consumption, with the greatest growth in dependency in the communications and trade industries. The goods-producing industries, such as manufacturing and construction, became less consumer dependent as the role of foreign trade, business investment, and government spending in generating employment grew.

**Table 3. Consumer-related employment by major occupational group, selected years 1987 and 1993, and projected 2005**

Major occupational group	Consumer-related employment (in thousands)			Total wage and salary employment (in thousands)			Consumer-related employment as a percent of total		
	1987	1993	Projected 2005	1987	1993	Projected 2005	1987	1993	Projected 2005
Total, all occupations .....	64,030.1	71,648.0	84,086.9	104,183.7	112,312.1	132,984.4	61.5	63.8	63.2
Executive, administrative, and managerial occupations .....	6,145.1	6,609.7	7,947.5	10,181.4	10,769.1	13,267.8	60.4	61.4	59.9
Professional specialty occupations ...	6,232.2	7,877.7	11,048.4	12,839.0	15,337.2	20,601.9	48.5	51.4	53.6
Technicians and related support occupations .....	2,215.7	2,791.5	3,516.8	3,658.8	4,267.4	5,212.3	60.6	65.4	67.5
Marketing and sales occupations .....	7,987.6	9,314.1	11,605.7	9,927.1	11,301.2	14,462.1	80.5	82.4	80.2
Administrative support occupations, including clerical .....	13,398.2	14,558.1	15,223.6	21,019.6	22,232.6	23,650.2	63.7	65.5	64.4
Service occupations .....	12,679.5	14,533.5	17,991.1	16,622.4	18,767.1	23,400.5	76.3	77.4	76.9
Agriculture, forestry, fishing, and related occupations .....	1,486.4	1,504.2	1,553.9	1,966.4	2,001.1	2,248.6	75.6	75.2	69.1
Precision production, craft, and repair occupations .....	5,424.9	5,629.4	5,943.2	12,101.9	11,843.3	12,911.2	44.8	47.5	46.0
Operators, fabricators, and laborers .....	8,460.5	8,829.8	9,256.7	15,867.1	15,793.0	17,229.7	53.3	55.9	53.7



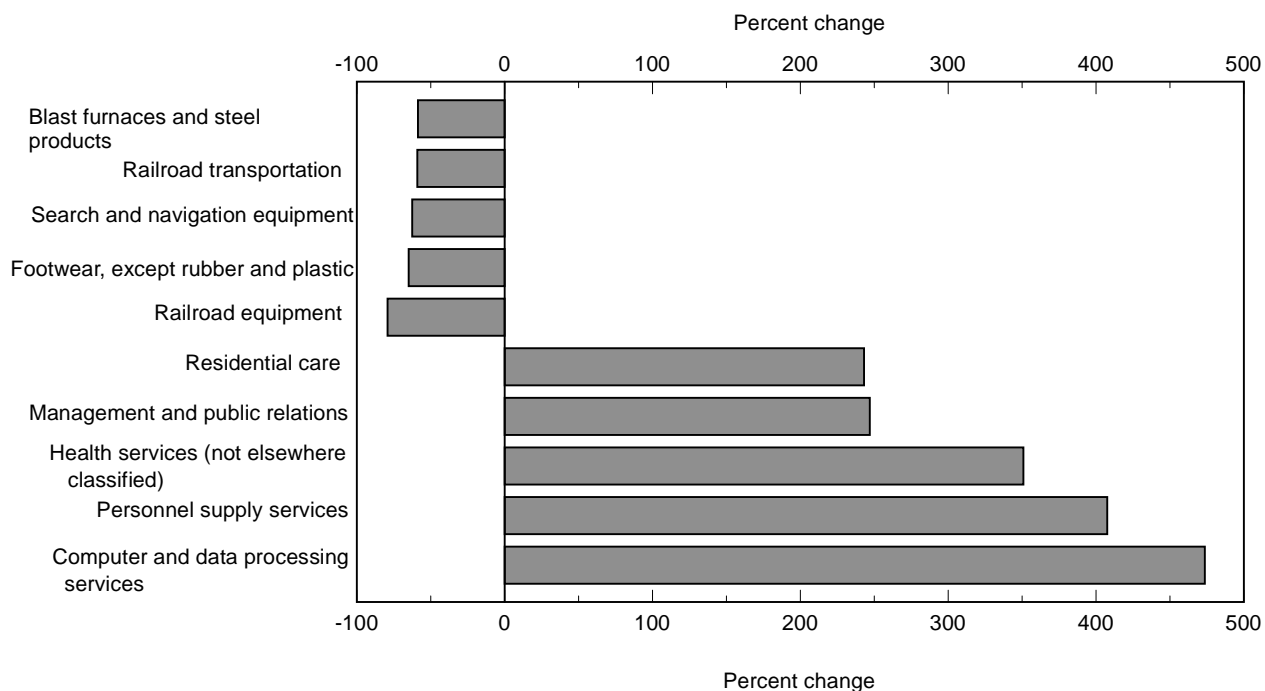
Another interesting way to look at change over time is to view the industries with the fastest and slowest consumer-related employment growth. As chart 1 shows, between 1977 and 1993, the industries with the fastest employment growth generated both directly and indirectly by consumption are all services: computer and data processing services; personnel supply services; health services, not elsewhere classified; management and public relations; and residential care. The reason for the rapid growth in services is threefold: increased demand for current services, an expanding array of new personal services, and the labor intensive nature of the industry. While other industries (such as glass and glass products and air transportation) were able to meet increases in demand through automation, many of the services industries had to hire more workers because of the limited potential for automation in these industries. (For example, the child day care services industry is not prone to automation because of the nature of the service—machines cannot replace workers in this industry.) It is interesting to note that many of the fastest growing industries were not the most dependent on consumer spending. Specifically, computer and data processing services, personnel supply services, and management and public relations depend on business investment, exports, and government spending for a significant portion of their employment. However, the industry growth over the 1977–93 period was so strong that even though consumers generate about

half to two-thirds of the employment in these industries, they were the fastest growing industries in terms of consumption-related employment.

The biggest declines in consumption-related employment over the 1977–93 time span were almost all manufacturing industries: blast furnaces and basic steel products; search and navigation equipment; footwear, except rubber and plastic; and railroad equipment. Here again, an industry's dependence on consumption does not directly translate to the employment growth in the industry. In the case of blast furnaces and steel products and footwear, except rubber and plastic, employment in the industries as a whole declined so much over the 1977–93 time span that they experienced the biggest consumption-related employment declines even though these industries were not among the least dependent on consumer spending for employment. It is interesting to note that although manufacturing employment declined over the period, consumer spending for goods in the manufacturing industries actually increased. The only nonmanufacturing industry among those experiencing the largest employment declines was railroad transportation, which declined as a result of companies transporting more goods by truck and consumers' declining use of railroads.

*Occupations.* Over the 1987–93 period,<sup>11</sup> with the exception of agriculture, forestry, fishing and related occupations, all of

**Chart 1. Percent change in industries with the fastest and slowest consumer-related employment growth, 1977–1993**



the major occupational groups became more dependent on consumption for employment. This growing dependency was particularly noticeable among professional specialty occupations such as social and human services workers and physical and recreational therapists, and technicians and related support occupations, such as emergency medical technicians and other health paraprofessionals and computer programmers. While almost every occupational group became more dependent on consumer spending, there were many individual occupations that became less dependent on consumption for employment. These include: recreation workers, photographers, aircraft pilots and flight engineers, bill and account collectors, heating, air-conditioning and refrigerator repairers, and machine assemblers.

The rapid growth in the services industries was one of the prime factors determining which occupations grew the fastest in the historical period. The fastest growing occupations were professional specialty occupations, such as computer programmers, nurses, engineers, and human services workers. (See table 3.) Given that three-fourths of all professional specialty occupations are found in the services industries, the rapid growth of these occupations makes sense. Technicians and related support occupations were also heavily affected by the growth in the services industries, given that more than 60 percent of these workers were employed in services over the period. Another occupational group that benefited from the growth in services was the service occupations, such as waiters and waitresses, janitors and cleaners, and nursing aides. About half of all service workers are employed in services industries.

The declines in manufacturing employment over the historical period translated to declining employment for specific groups of occupations. In particular, operators, fabricators, and laborers, such as machine tool cutting operators and crane and tower operators, as well as precision production, craft, and repair occupations, such as electronics repairers and machinists, experienced employment declines.

## Indirect employment from consumer spending

Consumers influence employment via direct and indirect routes. When consumers make a purchase, employment is generated not just in the industry that produces that final good or service (direct employment), but in the industries that supply inputs to the final good or service that was purchased by the consumer (indirect employment). For example, when we buy a television, we generate employment not just in the communications equipment industry, but in the electronic components and accessories industry, trucking and warehousing, advertising, and retail sales—industries which supply inputs to the production of televisions.

Some industries that depend on consumer spending for employment indirectly are not clearly evident. These indus-

tries sell the bulk of their output to other industries rather than creating the final product that consumers buy, and include construction, mining, and agriculture, forestry and fisheries. In manufacturing, more jobs are generated indirectly by consumers than they are directly, because many of the goods consumers buy require inputs from other manufacturing industries.

Several of the 15 industries with the highest ratios of indirect to total employment generated by consumer spending are Federal, State, and local government industries that provide services to individuals and households, as the following tabulation shows:

<i>Industries with the most employment</i>	<i>Percent of total indirect employment indirectly related to consumption, 1993</i>
Federal Government enterprises, not elsewhere classified .....	98.4
Insurance agents, brokers, and service .....	89.2
Metal cans and shipping containers .....	79.8
Local government passenger transit .....	76.7
Federal electric utilities .....	74.1
State and local electric utilities .....	74.1
Commercial printing and business forms .....	70.9
Service industries for the printing trade .....	70.0
Advertising .....	69.8
Crude petroleum, natural gas, and gas liquids .....	67.6
Weaving, finishing, yarn, and thread mills .....	66.6
Miscellaneous publishing .....	65.9
Knitting mills .....	65.6
Agricultural production .....	64.8
Paperboard containers and boxes .....	64.6

Some of the others such as insurance agents and advertising are business services that are not sold directly to consumers, but are ultimately targeted toward them. And others are manufacturing industries that provide inputs to industries producing goods that are purchased mainly by consumers. Throughout the 1977–93 period this list did not change—the industries with the highest levels of indirect employment generated by consumption continued to be government, business services, and manufacturing.

## Future jobs

Consumers will continue to be a major force in determining the level of employment and types of jobs in our economy. The share of employment dependent on consumption is expected to level off in the future, remaining at 64 percent in 2005, based on the fiscal policy assumptions made in preparing the 1994–2005 projections. The rate of increase in consumer-related jobs is projected to be less than the rate of increase in consumer spending because of projected changes in productivity growth and the changing input requirements of producing industries. Consumption-related employment growth is expected to be significantly slower than in the his-

torical period, falling from a 2.1-percent annual growth rate over the 1977–1993 period to a 1.3-percent annual growth rate for the 1994–2005 period. The slowdown is the result of slower population and labor force growth, as well as automation and other efficiency improvements.

Changes in consumer purchasing decisions will lead to changes in the industries and occupations where people work. In summary, among the changes that we can expect through the year 2005:

*Durable goods.* Despite projections that consumers will spend an increasing share of their expenditures on durable goods, such as computers and video and audio products, as well as household furniture, appliances and related goods, consumer-related employment in most durable goods manufacturing industries is expected to decline because of technological changes that lead to new production requirements and higher productivity. Among the industries that are projected to experience the fastest employment declines are: Footwear, except rubber and plastic; computer and office equipment; watches, clocks, and parts; household audio and video equipment; and tobacco products. It may seem surprising to see employment declines in computer and office equipment and household audio and video products, two industries in which consumers are expected to spend even more money in the future. However, these industries are highly automated and productive, and often have high import penetration rates, so consumer spending on these products generates little domestic employment. In conjunction with the projected decline in manufacturing employment will be a decline in most of the occupations found in these industries, including: managers and administrators; clerical and administrative support workers; machine operators, tenders, setters and set-up operators; and helpers, laborers, and material movers.

*Services.* The projected increasing share of consumer spending on services will result in a continued restructuring of employment in the future. A growing share of the jobs generated by consumers will be in the services industries, including nursing and personal care facilities, health services not elsewhere classified, personnel supply services, computer and data processing services, amusement and recreation services, child day care services, and individual and miscellaneous social services. While more than half of the job growth dependent on consumption between 1977 and 1993 was in services industries, that number is expected to jump to two-thirds between 1993 to 2005. While the services industries will continue to remain the industries most heavily dependent on consumption in the future, this dependence will decline slightly because the role of business investment and exports in job creation is projected to increase. The occupational impact of the increase in consumer spending on services will be seen foremost in the growth of professional specialty occupations, for which growth is expected to be even more pro-

nounced than in the past, not only because of the strong growth in services industries, but from the limited potential for automation in these industries, and the need for more highly trained and educated workers. While the professional specialty occupations tend to be least dependent on consumer spending, their reliance on consumer expenditures for employment has been increasing and is expected to continue to do so through 2005. Technicians and related support occupations will continue to be among the fastest growing through 2005, not only because of growth in the services industries, but because of the increasing reliance on these workers as less expensive alternatives to getting a job done. Service occupations will grow even faster in the projected period as consumers demand more personal services and as an expanding array of new services are offered. The service occupations have consistently been one of the most dependent on consumer spending for employment, and will continue to be so through 2005.

*Nondurable goods.* The projected declining share of consumer expenditures going toward nondurable goods, such as food, clothing, gasoline and oil, and home and personal products, will have a varying impact on the industries and occupations that produce these goods. While consumer-related employment in nondurable goods manufacturing will decline overall, the decline will be less than that of durable goods manufacturing and, unlike durable goods manufacturing, there will be a number of industries that actually experience employment increases. These industries include meat products, periodicals, commercial printing and business forms, and miscellaneous plastics products, as well as industries that produce home and personal care products such as drugs and soaps, cleaners, and toilet goods. Growth in these industries will occur as a result of one or more factors: limited automation potential; the labor intensive nature of production; and very strong growth in demand for the product. As mentioned, many nondurable goods-producing industries will decline, particularly in food- and clothing-related industries, such as dairy products, bakery products, beverages, knitting mills, and apparel. The declining share of consumer spending going toward nondurables will affect various occupations differently. In some occupations, such as meat, poultry, and fish cutters (by hand), mechanics, installers, and repairers, and sales and related workers, there is less potential for technological change, so employment generated by consumer spending will increase. In others, such as blue-collar worker supervisors, garment sewing machine operators, and clerical and administrative support workers, automation and workplace reorganization is expected to cause employment to decline.

IN SUMMARY, because consumer spending accounts for about two-thirds of total gross domestic product in the United States, the choices consumers make in purchasing goods and services are an important force in determining the output of the economy, and the employment necessary to achieve this pro-



duction. The most noticeable trend currently underway is consumers spending an increasing share of their disposable

income on services, causing a growing share of employment to be in the services industries. □

## Footnotes

<sup>1</sup> Imports are excluded from this analysis. See appendix for more information.

<sup>2</sup> The projections cover the 1994–2005 period. This study uses the year 1993 rather than 1994 in analyzing consumer spending and the related employment because it is the latest year for which the detailed data needed for this study was available.

<sup>3</sup> For more information on the assumptions and methodology used to develop these projections, see “Appendix: Employment projections methodology,” *Monthly Labor Review*, November 1995, pp. 85–87; and “Employment Outlook: 1994–2005, Job Quality and Other Aspects of Projected Employment Growth” Bulletin 2472 (Bureau of Labor Statistics, 1995).

<sup>4</sup> These accounts display the value and composition of national output and the distribution of incomes generated in its production. For more information, see “An Introduction to National Economic Accounting” (U.S. Department of Commerce, National Technical Information Service, March 1985).

<sup>5</sup> *Statistical Abstract of the United States 1990* (U.S. Department of Commerce, Bureau of the Census, 1990) table 82, p. 63.

<sup>6</sup> Ronald E. Kutscher, “Historical trends, 1950–92, and current uncer-

ainties,” *The American Work Force: 1992–2005*, Bulletin 2452 (Bureau of Labor Statistics, April 1994).

<sup>7</sup> *Statistical Abstract of the United States 1990*, Section 26, “Construction and housing.”

<sup>8</sup> Norman C. Saunders, “The U.S. economy to 2005,” *Monthly Labor Review*, November 1995, pp. 29–44.

<sup>9</sup> Note that in the National Income and Product Accounts, construction of personal residences is counted as part of residential construction, rather than personal consumption expenditures. To account for consumer housing expenditures, an imputed value is calculated for owner occupied housing in which the imputation creates a business that purchases housing and subsequently sells housing services to consumers.

<sup>10</sup> For more information on salaries and training and education requirements of occupations, see tables 1 and 2 in *Occupational Projections and Training Data*, Bulletin 2471 (Bureau of Labor Statistics, 1996).

<sup>11</sup> In dealing with occupations, the study uses the year 1987 rather than 1977 when looking at historical employment data because no comparable 1977 occupational data are available.

## APPENDIX: Description of data and methodology

What tools are used to transform consumer spending in a historical year to the employment generated by these expenditures? The framework for such an analysis is personal consumer expenditures data from the National Income and Product Accounts and input-output data, both of which are prepared by the Bureau of Economic Analysis. Data on personal consumer expenditures are published annually and consist of 80 categories of goods and services. The input-output data is published every 5 years and consist of two main tables—a make table and a use table. The make table shows which commodities an industry makes, including both primary and secondary products, while the use table shows the inputs used by an industry in producing those commodities. The use table also provides information on the technology used in production, purchases of commodities by final users, and the value added to production in each industry, such as compensation of employees, indirect business taxes, and corporate profits.<sup>1</sup> The use table bridges the gap between the National Income and Products Accounts data on consumer spending and the industries producing these goods and services.

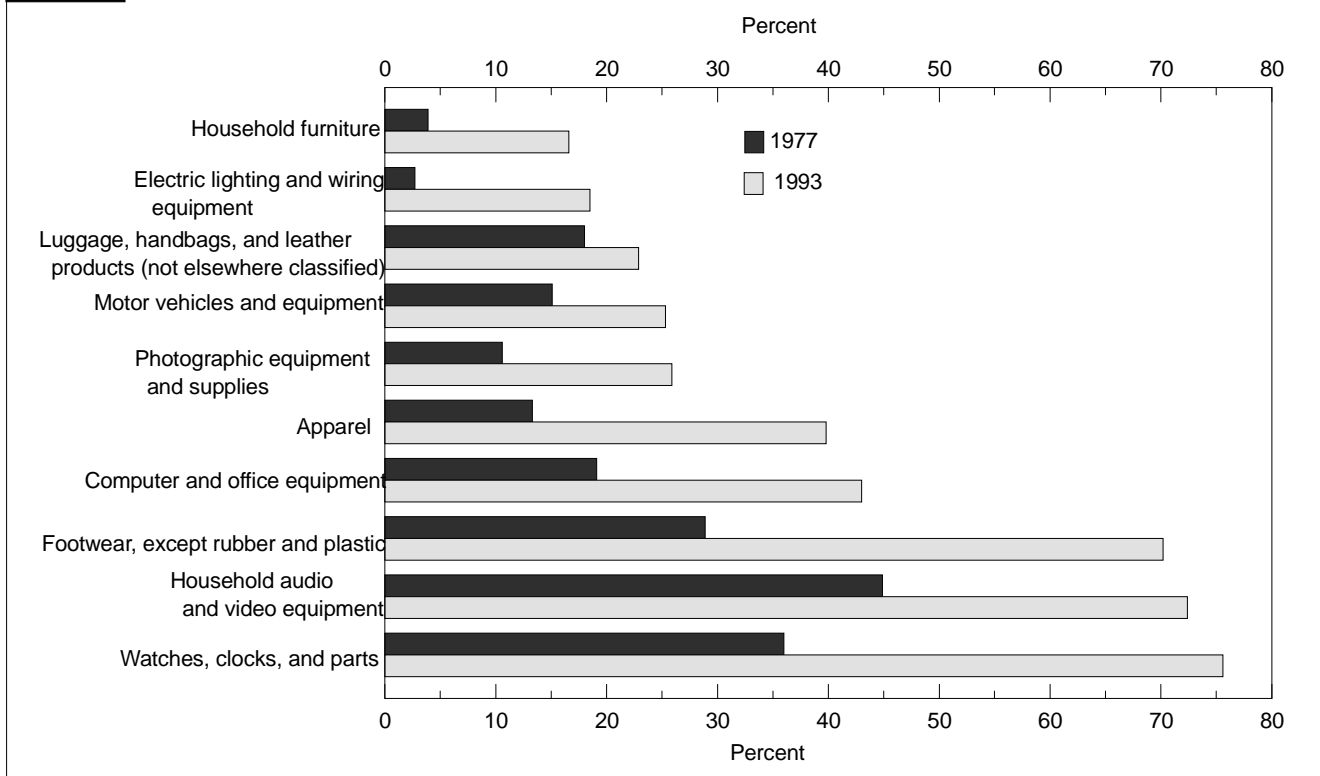
The value of the input-output system is that it provides a snapshot of all transactions within the economy at a given point in time—sales of products to each industry for further processing (intermediate demand) and to final users, including not just consumers, but businesses investment, government, and net exports (final demand, or gross domestic product). Given this information on interindustry and final user purchases of goods and services, it is possible to perform an analysis that starts with data on the commodities that consumers purchase and traces the path of production of these commodities not just to the obvious industries, for example, automobiles being produced in the automobile industry, but through the entire production chain, including inputs to production, such as steel and plastics to the automobile industry and back to the domestically produced raw materials for these products. By tracing the

purchase of a good or service through the entire production chain, the analysis can proceed to the next step—determining the employment required in each industry, including the industries that supply inputs to the production process, to produce a good or service.

By tracing the purchase of a good or service through the entire production chain, the analysis can proceed to the next step—determining the employment required in each industry, including the industries that supply inputs to the production process, to produce a good or service.

The transition from production in the input-output tables to employment is accomplished by first deriving a total requirements table from the use and make tables. The total requirements table shows the total production requirements necessary to support a dollar of final demand. The term “total” in this case includes both the direct input requirements to production and the indirect input requirements. The total requirements table is then scaled by productivity factors (the employment-output ratio for each industry is used as a proxy for productivity) to convert the production required per dollar of demand to the employment required per dollar of demand. This result is known as an employment requirements table—the heart of this analysis. The employment requirements table demonstrates how industry interrelationships in the economy affect employment. We see that consumer purchases of food not only support employment in the processed food and agricultural industries, but in the paper and logging industries that provide packaging materials for the food that consumers purchase.

*Imports.* In this analysis, employment requirements tables were calculated for 1977, 1987, 1993 and 2005. Because the study focuses on consumer spending and the domestic employment that results from this spending, imports are excluded from this analysis. However, we acknowledge that imports are becoming an increas-

**Chart A. Import penetration rates of industries with growing consumer expenditures and declining consumer-related employment, 1977 and 1993**

ingly important factor in many consumer purchases. As chart A shows, the import penetration rates (the ratio of imports to total supply of the commodity) of certain industries that supply consumer goods grew over the 1977–93 period, and in some cases, imports now account for much of the consumers’ purchases.

Imports, affect the study in two ways. Some of the products that consumers buy are imported, and because no domestic employment is generated by such purchases, consumer spending on imports must be separated from consumer spending on domestically produced goods. In addition, some of the inputs that industries use to produce a product are imported. These inputs must be separated from domestically produced inputs because the production of these imported inputs does not contribute to U.S. employment. The only distinction the input-output tables make between imported and domestically produced goods is a vector showing total imports by commodity—there is no complete information telling how these imported commodities are distributed among industry input purchases and purchases by final users. For this analysis, two assumptions were made to distribute the import vector among final users and industries so that imports could be subtracted. First, exports are not imported (though they can be made with imported inputs). And second, for each commodity, the fraction of a commodity’s U.S. sales that is imported is constant among the industries and final users buying the commodity. With these two assumptions, the initial employment requirements tables were adapted to derive import-adjusted employment requirements tables for 1977, 1987, 1993, and 2005.

When the import-adjusted employment requirements tables, which show the domestic employment required to support each dollar of demand, are multiplied by final demand, the result is the total domestic employment required to produce those domestic goods and services demanded by final users. Since this analysis focuses specifically on consumers and the employment generated as a result of their purchases, the employment requirements table is multiplied by personal consumption expenditures only.

*Industry-occupation matrix.* Industry employment is translated to occupational employment via an industry-occupation matrix that shows that proportion of workers in various occupations within each industry. This information on staffing patterns is developed from the Bureau’s Occupational Employment Statistics survey. Using the industry-occupation matrix, we multiply industry employment by these staffing patterns to generate the occupational employment attributable to consumer spending on domestically produced goods and services.

*Limitations.* An employment requirements analysis such as this has certain limitations attributable to the structure of the input-output system and the requirements tables used. First, in order to remove the effects of relative price changes over time, BLS has repriced the input-output tables in 1987 dollars. Because it is not possible to compute a deflator for each cell in the input-output table, entire rows of the table are deflated with the same deflator. This may lead to some distortions of the data to the extent that a commodity is priced differently

to different users or that the different commodities in each row are priced differently. Second, multiplier effects are not accounted for. When consumers purchase a commodity, the impact on production is calculated. However, the impact of spending this income generated in the form of wages by the commodity's production is not included. If this multiplier effect were taken into account, the employment impact of the initial consumer purchase would be larger. Third, the impact on capital requirements to replace old or build new capital—the accelerator effect—is also not included. And fi-

nally, the data underlying the employment requirements tables represent annual averages and should be used for marginal analysis—that is, the effect of an additional increase or decrease in expenditures—with caution.

<sup>1</sup> Production of goods and services within the input-output system is valued in producer's dollars. This means that the transportation and trade distribution costs associated with the purchaser's price of a product are moved to the transportation and trade industries so that only the value of production, including indirect business taxes, is included in the producer's price.